Data Use in the Gulf of Mexico Shrimp Stock Assessments

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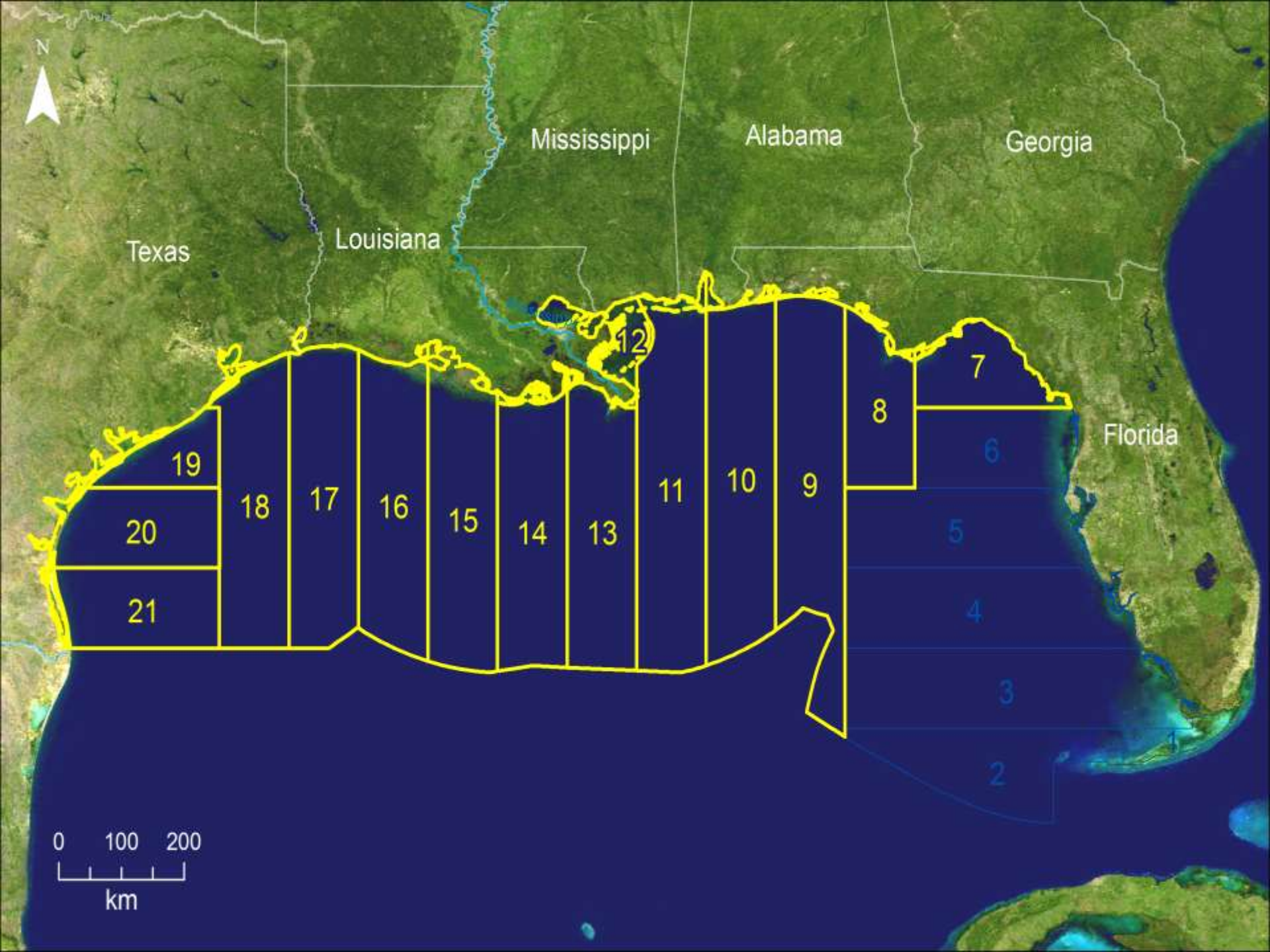
Model and Data Inputs
Catch Data

Gulf of Mexico has been subdivided into 21 statistical zones (Patella 1975)

- All of the data inputs for the shrimp stock assessments are based on these subdivisions

- Commercial offshore shrimp data collected from statistical zones
  - Brown and White Shrimp models use data from stat zones 7-21
  - Pink Shrimp models use data from stat zones 1-11

- Port agents randomly visit fishing ports to interview fishing captains and record data
  - Interview data collected include:
    - Time fished (effort)
    - Location and depth fished
  - Dealer Records
    - Species specific pounds and sizes of shrimp landed
    - Number of Trips
    - General statistical location
- Effort is also collected with electronic log books on subsample of vessels
- State trip ticket system also collects fishing data including location and landings


N
Texas
Louisiana
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12
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10
9
8
7
6
5
4
3
2
1
0
100
200
km

Data Inputs
Fisheries Dependent

The Gulf of Mexico Stock Synthesis shrimp stock assessment models use commercial catch data from 1984-2011.

- Directed fishing effort by year and month, i.e., effort for those trips where >90 percent of the catch were the targeted species used to calculate monthly CPUE ± standard error

- Total monthly catch

- Catch by month and size, i.e., size composition data consisting of count of numbers of shrimp per pound (11 count categories)

Data Inputs
Fisheries Independent

Assessments incorporate 3 indices of abundance:

- SEAMAP Summer Groundfish Trawls (Fisheries-independent 1987-2011)
  - Catch by Size (1 mm increments)
  - Catch Rates (Delta Lognormal transformed ± standard error)

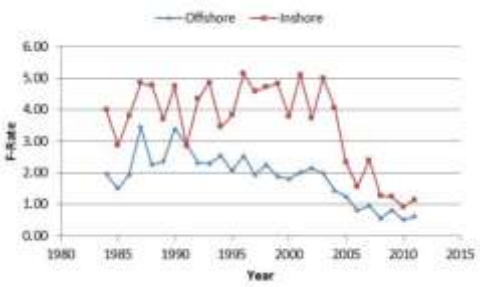
- SEAMAP Fall Groundfish Trawls (Fisheries-independent 1987- 2011)
  - Catch by Size (1 mm increments)
  - Catch Rates (Delta Lognormal transformed ± standard error)

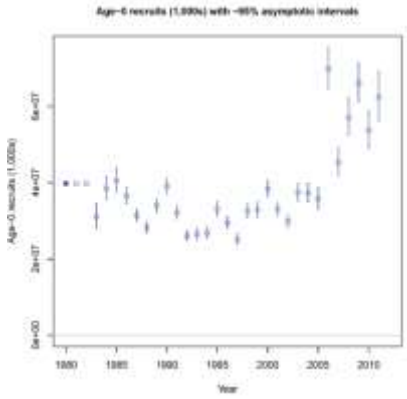
- Louisiana Inshore Shrimp Trawl Surveys (Fisheries-Independent 1984-2011)
  - Catch by Size (1 mm increments)
  - Catch Rates (Delta Lognormal transformed ± standard error)

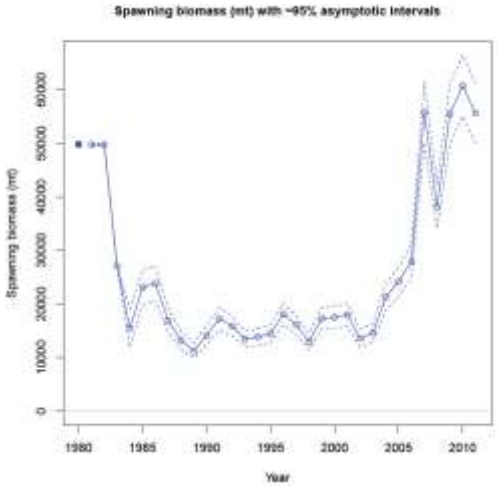
Assessment Outputs

Assessment models provide measures of stock status and health
Outputs include:

- Spawning Biomass estimates
- Recruitment estimates
- Fishing Mortality



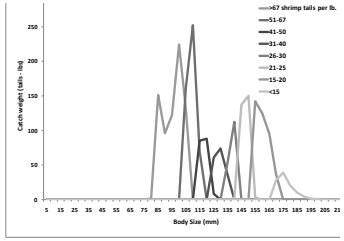


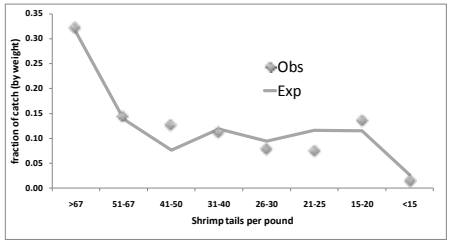


Addressing Uncertainty in Assessment Outputs

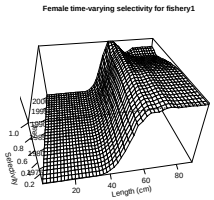
- Variance in parameters estimated based upon goodness of fit of Wght Comp Data

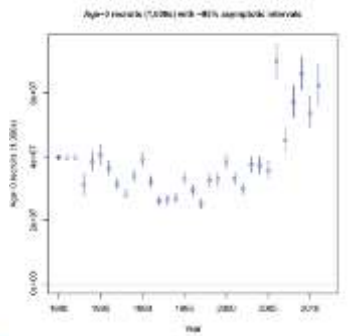
- Model Inputs (Standard Errors)
  - CPUE
  - Catch
  - SEAMAP CPUE
  - Louisiana Survey





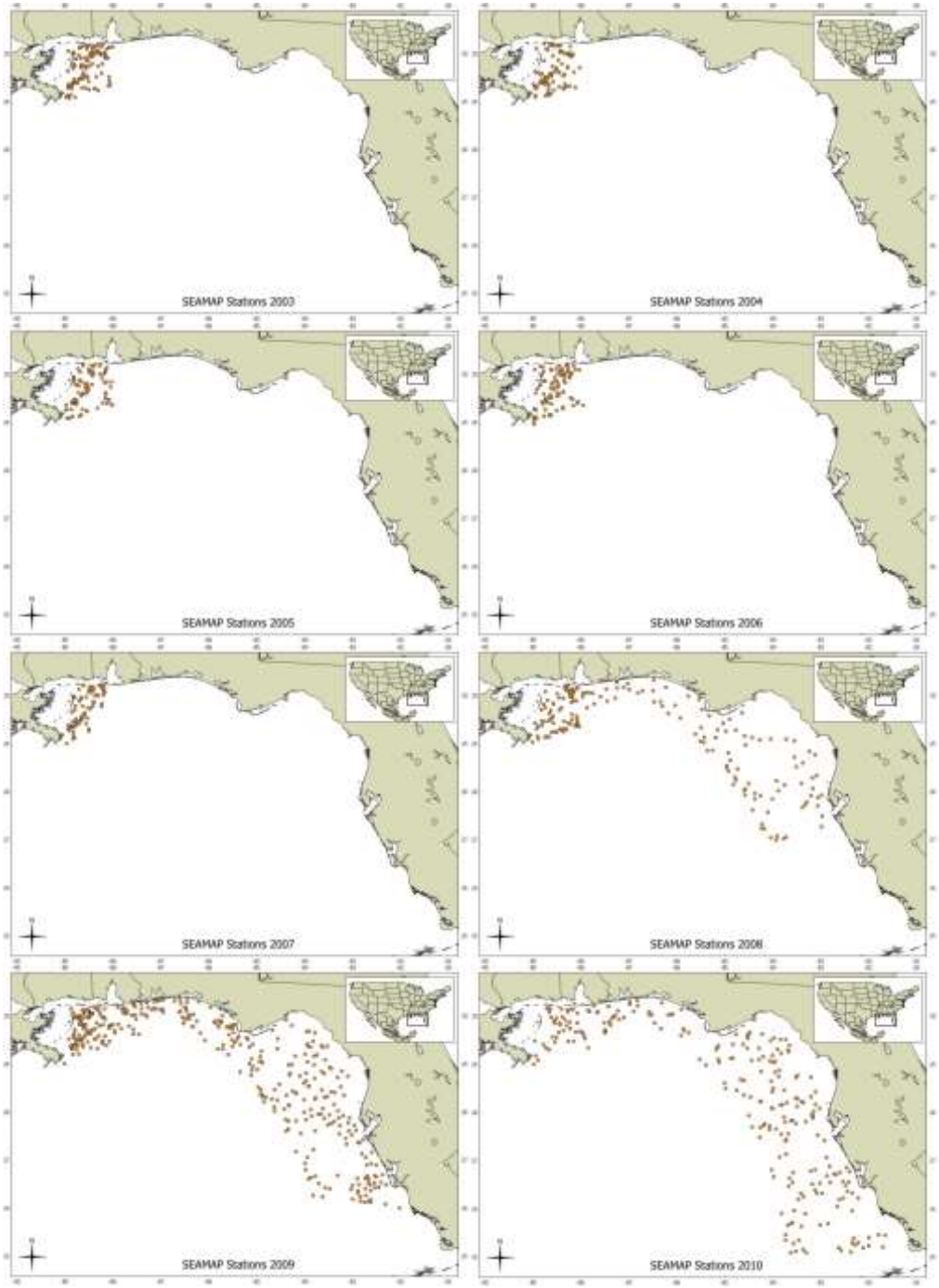
- Outputs (Asymptotic Confidence Intervals)
  - Spawning Biomass
  - Recruitment
  - Fishing Mortality (F)





Data Shortcomings Relative to Assessment

- Data Latency – Commercial fisheries data are not available until August-September of the following year
  - Assessment models must be completed before the Fall Gulf Of Mexico Fisheries Management Council Meeting
- SEAMAP surveys are not sampling in the main pink shrimp fishing grounds



SEAMAP Data Collection Sites

1987-1994

1995-2002

2003-2010

Pink shrimp SEAMAP sampling locations, 1987-2010.

Conclusions

- Assessments use both fisheries dependent and independent data
- Data are not “Final” until August –September of the following year
- There are improvements needed in the trip ticket system concerning latency of information
- Shrimp assessments would be difficult with trip ticket data alone